DOCUMENT RESUME

ED 411 951 PS 025 768

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TITLE The Relationship between Teacher Behaviors and Student Academic Engagement in an Inner-City Preschool.
PUB DATE 1997-05-00
NOTE 33p.; Paper presented at the Annual Training Conference of the National Head Start Association (24th, Boston, MA, May 25-31, 1997).
PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Academic Achievement; *Attention; Day Care Centers; Instructional Effectiveness; Performance Factors; *Preschool Children; Preschool Curriculum; Preschool Education; *Preschool Teachers; *Teacher Behavior; Teacher Effectiveness; *Teacher Influence; Time On Task; *Urban Schools
IDENTIFIERS *Student Engagement

ABSTRACT

This study examined whether teacher behaviors (such as teacher enthusiasm, level of lesson difficulty, teacher voice volume and inflection, teacher use of inquiries, and teacher use of positive feedback) were related to student academic engagement in an inner city day care center. Data were collected by videotaping 13 teachers and 94 ethnic minority children in the day care center. Analysis indicated that all five teacher behaviors were related to student academic engagement, although none of these correlations was statistically significant. Student academic engagement was also found to be significantly correlated with measures of emergent literary skills. Results suggest that educational researchers include engagement among their outcome variables, and that educators add fostering student engagement to the goal of increasing student academic achievement. (JPB)

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The Relationship Between Teacher Behaviors and Student Academic Engagement in an Inner-City Preschool

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ABSTRACT

The relationship between teacher behaviors and student academic engagement is poorly understood. The present study examined whether 1) teacher enthusiasm, 2) level of difficulty of lesson, 3) teacher voice volume/inflection, 4) teacher use of inquiries, and 5) teacher use of positive feedback, were related to student academic engagement of inner-city preschool students. In addition, I investigated whether student academic engagement correlated with emergent literacy skills. Data were collected on 13 teachers and 94 ethnic minority children in a northeastern, inner-city daycare center. I hypothesized that all five teacher behaviors would be related to student academic engagement. I further hypothesized that student academic engagement would be significantly correlated with emergent literacy skills. Results indicate that all 5 teacher behaviors were related to student academic engagement. However, none of these correlations were statistically significant. Student academic engagement was found to be significantly correlated with measures of emergent literacy skills. I suggest that educational researchers should include engagement as one of their outcome variables. I also suggest that educators should add the goal of fostering student engagement in school to the goal of increasing student academic achievement.

The Relationship Between Teacher Behaviors and Student Academic Engagement in an Inner-City Preschool

School failure is rampant in the United States. As children progress through school, many feel increasingly disaffected from education (Harter, 1981). The teacher-student relationship has recently become a focal point for those who seek to better the educational experiences of children in this country. Contrary to the once popular thinking that the curriculum is the sole important aspect of education, today the process of teaching has taken on a more prominent role, as seen through programs such as Whole Language. Only since the early 1970's has the community of educational researchers agreed that teacher behaviors have a significant impact on students (Nussbaum, 1992). This zeitgeist is summarized by Brophy (1986) who writes, "unless they are prepared to change the basic nature of schooling, would-be innovators will need to work through, not around, teachers" (p.1071).

Psychologists and educators have extensively studied how teachers affect student achievement (for review see Brophy, 1986). In contrast, research which examines how teachers affect student academic engagement and interest is virtually nonexistent, despite evidence that student engagement and interest in school is critical for achievement (Lonigan, Anthony, Arnold, & Whitehurst, 1994; Skinner, Wellborn & Connell, 1990; Coker, Medley & Soar, 1980; Stallings, 1975) and acknowledgment in the educational community that student academic engagement is an important subject. In a poll of school-based educators and reading specialists, "creating interest in reading" was rated the greatest of 84 problems faced by the field, and 4 of the top 10 problems were related to children's academic engagement (O'Flahavan, et al. 1992). Further, researchers such as Scarborough and Dobrich (1994) have called for more research on children's motivational factors such as engagement and interest.

Academic engagement is the state of being involved in schoolwork. Skinner and Belmont's (1993) suggest that engagement has both behavioral and emotional components. Children who are engaged show continuous behavioral connection. They concentrate on the task at hand, remain alert and show a high degree of effort. Engaged children also show emotional involvement. They display enthusiasm, interest, and positive affect.

Previous research has demonstrated a link between teacher behaviors and student achievement (e.g. Dunning & Mason, 1984). I believe that at this most basic level, this connection is in part made up of two smaller links; the relationship between teacher behaviors and student academic engagement, and the relationship between engagement and academic achievement. Skinner and Belmont, (1993) have proposed a similar causal chain, and they believe that the relationship between teacher behaviors and student engagement is reciprocal and is mediated by both student and teacher perceptions. Lonigan et al. (1994) argue that any explanation of reading acquisition that includes child interest is incomplete without an explanation of the precursors of child interest. I would argue that the same can be said for student academic achievement in general. In other words, any explanation of student academic achievement that includes student engagement or interest, is incomplete without an explanation of what factors produce student engagement or interest. Some of the most important factors that produce student academic engagement may be teacher behaviors.

That adults can influence student academic engagement is suggested by classroom studies. Skinner and Belmont (1993) examined three dimensions of elementary school teacher behavior, and found that involvement, optimal structure, and autonomy support (amount of freedom child is given to determine his or her behavior) predicted student engagement. Furthermore, they found reciprocal effects of student engagement on teacher behaviors. Newby,

(1991) examined the motivational strategies used by elementary school teachers and found that relevance (strategies that make the material relevant to the students' lives) and satisfaction (reinforcing positive behavior, and punishing negative behaviors) strategies were both significantly related to student on-task behavior. Brophy, Rashid, Rohrkemper, and Goldberger, (1983) studied elementary school classrooms and found that student engagement was higher when teachers started tasks immediately than when they began with some presentation.

Research on shared picturebook reading between parents and children also suggest the link between adult behaviors and child engagement. For example, Ortiz, Arnold, & Stowe (1996) examined the relationship between parental reading behaviors, and child engagement. On average, parents who underwent a short intervention that consisted of suggestions on how to get their child more engaged in reading increased their children's reading engagement levels significantly more than did control parents. Lonigan, et al. (1994) found that parental enjoyment of reading was shown to correlate significantly with child interest in reading. While correlational data does not prove causality, these data suggest that adult behavior may have an influence on child engagement in learning.

The link between engagement and academic achievement, is more firmly established. Lonigan, et al. (1994) studied shared reading in a sample of 65 mothers and their two-year-old children and found that interest was a strong predictor of children's language skills. Crain-Thoreson and Dale (1992) selected 20-month-olds for verbal precocity and followed them through age 4 1/2. They initially observed children's engagement during a storybook session and found that interest predicted language, cognitive, and literacy outcomes. Wells (1985) obtained parental retrospective reports of how interested their children were in shared reading as preschoolers, and found that these reports were strongly related to the children's literacy

development. There is also some support for the link between engagement and academic achievement from research on classrooms. For example, in a study of children in the Netherlands, there was a significant relationship between percentage of time on task and some measures of academic ability (Veenman, Lem, & Voeten, 1988). Furthermore, Skinner, Wellborn, and Connell (1990) found that student academic engagement correlated .53 with student grades, and .41 with achievement test scores.

The few studies that have examined the relationship between teacher behaviors and student engagement provide an important starting point for understanding the antecedents of student engagement. However, almost all studies on student academic engagement have examined elementary school children and older. The emergent stages of children's engagement have not been well studied. Given the many differences between elementary aged children, and preschoolers, knowledge about older children may not generalize. It seems crucial to study this age group given evidence that individual differences in emergent literacy, and numeracy (competence in mathematics) may be maintained or even magnified as these children progress through school (Morrison, McMahon, & Williamson, 1993). Studies of younger children may provide better understanding of the emergent stages of children's academic engagement and may more easily facilitate the prevention of school failure. If students can be engaged by teachers from an early age, they can potentially experience a qualitatively superior learning experience. Methodological characteristics of a number of past studies in the area of student academic engagement also make further study necessary. Most of the studies done in this area have employed very few teachers as subjects (Brophy, et al., 1983; Marshall, 1987) or have used subjective measures of student engagement. For example, Skinner, et al. (1990) obtained levels of student engagement through teacher reports. Marshall (1987) did not systematically record

objective measures of student engagement and Skinner & Belmont (1993) and Skinner, et al. (1990) evaluated teacher behaviors through self report only (teacher report and student report, respectively). The present study used the more objective measures of engagement through the use of trained coders to record the percentage of time that students are on task and count or measure operationalized teacher behaviors.

The question of student engagement is particularly important in the context of a preschool that serves low socioeconomic status (SES) children. Even before they enter school, poor children often do not have the necessary skills for school success (Walker, Greenwood, Hart, & Carta, 1994). In addition, children from low SES families are at a much higher risk for developing academic problems (e.g., Wilson, 1987). Low SES is thought to be the single greatest risk factor for academic failure and disengagement (Offord, Alder & Boyle, 1986). Even if they do have the necessary skills, the school environment may make it exceedingly difficult for them to learn. One study found that regardless of a child's home environment, children in poorer preschool environments performed worse on measures of achievement, and preacademic skill (Bryant, Burchinal, Lau, & Sparling, 1994). Furthermore, researchers have argued that inner-city children often go to schools where they may be taught in ways that do not elicit engagement (e.g. Carta, 1991).

In sum, the present study adds to the literature on this topic by examining the relationship between teaching behaviors and student academic engagement. Furthermore, this study observed a low SES sample of preschool children using objective measures. Finally, the link between teacher behaviors and student engagement and the link between student engagement and student achievement was studied with the same sample. This is the only study to the knowledge of the experimenter that has examined both links with the same participants. Since this study is one of

the few that has investigated engagement in an inner city setting. I sought to examine conceptually simple teacher behaviors. Specifically, the present study examined five teacher behaviors and their relationship with engagement. They were 1) enthusiasm, 2) level of difficulty of lesson, 3) voice volume/inflection, 4) use of inquiries, and 5) use of positive feedback.

Discussion of Teacher Behaviors

Enthusiasm

The relationship between enthusiasm and learning in the classroom is strong (e.g. Bettencourt, Gillett, Gall, & Hull, 1983). I believe that enthusiasm is likely to affect student academic engagement as well. One reason that teacher enthusiasm may elicit engagement is modeling. Teachers who act enthusiastically or in ways that communicate to their students that the task at hand is engaging or important may elicit similar feelings and/or beliefs from their students. Conversely, teachers who communicate that the activity is boring or a waste of time may elicit negative reactions from their students (Good & Brophy, 1980). Enthusiastic teaching is also likely to be more fun for students. Students who are enjoying what they are doing may then pay more attention.

Level of difficulty of lesson

The "zone of proximal development" is a well known concept in the study of learning (Vygotsky, 1978). Briefly stated, it is believed that children learn best when material is presented to them that is a bit more difficult than what they can presently master. Research on the difficulty level of lessons that are taught in school has demonstrated its important effects on achievement (Fisher, et al., 1980). There is reason to believe that lesson difficulty might be important to engagement as well. Skinner and Belmont (1993) studied the effect of teacher structure on student engagement. The construct of structure included finding the appropriate level of

difficulty for the child or the class. They found that, children's behavioral engagement was principally a function of student perceptions of teacher structure. Similarly, Veenman et al. (1988) found a significant correlation between lesson difficulty, and time on task. It seems likely that students may become bored and disengaged if the material is too easy. If material is too difficult, students may realize that they cannot keep up and this may lead to disengagement.

Use of inquiries

There is a strong consensus in the educational community that children need to be actively involved in classroom activities for optimal learning to occur (Carta, 1991). Evidence from successful preschool interventions (e.g. Whitehurst, et al., 1994b) suggests that asking children many questions about what they are learning can increase achievement. My clinical observations have also suggested that teachers who elicit student's input into learning exercises increase the student's engagement in the activity. One of the best ways to elicit student's input may be by asking them questions, or having them describe something about the activity at hand.

Use of positive feedback

A child's conception of him or herself as a student may be partly dependent on others' reactions and feedback. Furthermore, a child's investment in school may be related to the child's perceptions about his or her ability to succeed. The use of positive feedback is thought to contribute to these self perceptions. According to Reasoner (1983), past studies have shown a consistent relationship between a child's self esteem and school performance. The feedback of teachers is particularly important to a child's perceptions about his/her effectiveness as a student. Some researchers (Connell & Wellborn,1991; Skinner & Belmont, 1993) believe that for a child to be engaged, his or her social context must fulfill the child's basic psychological needs. These needs include the desire to feel competent. I theorize that positive feedback helps to fulfill this

need.

The evidence for the effect of positive feedback is mixed. According to Brophy (1986) the frequency of teacher praise usually correlates positively with student academic achievement, but these correlations are usually low, and sometimes are negative. For example, Newby (1991) found that the number of teacher strategies used that were extrinsic in nature, such as giving positive feedback, were negatively correlated with the frequency of student on-task behaviors. The effect of positive feedback on student engagement may be larger when those students are ethnic minorities. As Brophy (1986) has pointed out, low SES children (most often ethnic minority children) may need praise and positive feedback much more than higher SES children do because of their generally low confidence and security in school.

While the evidence for the importance of feedback in general is mixed, the type of feedback that is most often given in preschools may however be related to academic engagement. In preschools feedback tends to be short. Teachers may nod their heads or say "good" or "nice job". While elaborate praise appears to be unrelated to achievement (Crawford, Brophy, Evertson, & Coulter, 1977), minimal positive feedback correlates positively with student academic achievement (Wright, & Nuthall, 1970). Thus this teacher behavior may be an important one to study in this particular context.

Voice volume/inflection

Clinical observations suggest a wide range of voice levels among teachers. In addition, I have observed that some children may be particularly sensitive to teachers' voice levels. It appears that children are less likely to become engaged if a teacher has a very quiet or a very loud voice. Use of appropriate voice inflection may also increase academic engagement by getting the attention of the students and keeping the interaction lively.

In addition to these five hypotheses, it was hypothesized that student engagement would be related to emergent academic skills, as competence and engagement are likely to affect each other.

METHOD

Participants

Participants in this study were 94 preschool students (mean age: 4.7 years, SD: 11.02 months, 59% males, 41% females) from low income families who attended a daycare center in Springfield, Massachusetts. Sixty-six percent of the students were African-American, 29% were Latino and 5% were European American. Thirteen teachers from 7 classrooms also participated. The ethnic composition of the teachers closely mirrored that of the students. The Springfield day-care center was chosen because it appeared typical of a preschool that serves students from low income families.

Procedure

Approximately nine hours of videotape from each class were collected as part of a larger project. Several hours of videotape were taken in each classroom to allow teachers and students to habituate to the presence of the camera and of the researchers. The observations typically included free-play, singing, arts and crafts, story-time and other learning situations. For this study, clips of 13 teachers conducting storybook reading, and teaching lessons were used. These activities in particular were chosen because student academic engagement seemed to be extremely important if children were to benefit optimally. Clips ranged in length from 5 minutes to 10 minutes (clips were stopped at 10 minutes). The length of these clips seemed appropriate because clips of about the same length have appeared sensitive to individual differences in both adult behaviors and child interest/engagement (e.g. Ortiz, et al., 1996).

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Seven undergraduate research assistants coded the videotaped sessions according to the coding schemes described below. All coders were blind to the hypotheses of the study. Approximately one third of each coder's ratings overlapped with another coder's to allow for an estimate of the inter-rater reliability. Coders were unaware of which segments were checked for reliability. In cases where the same child was coded by two different coders, one was randomly chosen for the purposes of data analysis. Finally, to help prevent the coding of the teacher from affecting the coding of the students (and vice-versa), no coder ever coded both the teacher and the students during the same teaching activity. A series of standardized language tests described below were administered by trained testers. Each child was individually tested for approximately twenty minutes.

Coding

Teacher behaviors

1) Teacher enthusiasm was coded on a global scale of 1-7, with a score being given every 30 seconds. A score of 1 represented a teacher being extremely unenthusiastic and a score of 7 represented a teacher being extremely enthusiastic. Enthusiasm was defined to include high energy level, frequent demonstrative and animated gestures, emotive facial expressions, wide open eyes, and a look of interest about the activity being taught.

2) Level of difficulty of lesson was coded on a global scale of 1-7, with 4 being optimal. In assessing what was optimal for each class, the coders made assessments of the academic level of the class based on their experiences listening to classroom activities in many classrooms at the preschool observed in this study. A score was given every 30 seconds. Scores greater than 4 represented lessons thought to be too difficult for the students and scores below 4 represented lessons that were thought to be too easy. For the purposes of data analysis, the distance from the

optimal score of four was used. Thus lower scores represented a teacher who was teaching near the optimal level of difficulty.

3) Voice volume/inflection was coded on a global scale of 1-7. A score of 7 was given when a teacher's voice volume was moderate and when the teacher exhibited appropriate fluctuation of his or her tone. A score of 1 was given when the voice was extremely soft or extremely loud, and the tone of voice was without fluctuation.

4) Inquiries were counted. These are behaviors that required the students to answer a question or solve a problem. This category included questions such as, "How many days are there in a year?", as well as requests by the teacher that students do something such as, "Jose, count how many birds are on this page."

5) Positive feedback instances were counted. These were teacher verbal behaviors, such as saying "good job", and nonverbal behaviors, such as a smile or a nod, that positively reinforce a student's behavior.

Student Academic Engagement

Within each interval, students were coded as on or off task (paying attention or not), or both, to the exercise that the teacher was leading. Coders used the children's body language, facial expressions, and orientation with respect to the teacher to determine if a child was on task. If the academic task was stopped temporarily, neither on or off-task was coded. The percentage of on-task behavior was calculated as the number of intervals on task divided by this number plus the number of intervals off-task. This provided a proportion of on task behavior that could range from zero to one.

Measures of Emergent Literacy

The Expressive One-Word Picture Vocabulary Test (EOWPVT; Gardner, 1981), a test of expressive vocabulary; the Peabody Picture Vocabulary Test-Revised (PPVT-R; Dunn & Dunn, 1981), a test of receptive vocabulary; and the verbal expression subscale from the Illinois Test of Psycholinguistic Ability (ITPA; Kirk, McCarthy, & Kirk, 1968), a test of verbal ability in describing common objects, were used to measure emergent academic skills. Each of these measures have been standardized and normed on a national sample. Further, split half reliability is high for each measure (One-Word=.94, PPVT-R= .80, ITPA= .86). Taken as a group, these tests assess a complete spectrum of skills and knowledge in the area of language (Whitehurst, et al., 1994a). We used language skills as our measure of academic achievement because they are thought to be a critical component of reading skill and academic success in general (Arnold, Lonigan, Whitehurst, & Epstein, 1994).

These tests were administered in English, regardless of the primary language of the child taking the tests. It was decided that these tests were not fair measures of the Hispanic children's true verbal abilities since many children spoke Spanish fluently but scored poorly on these tests. It was hypothesized that since Hispanic children scored poorly on these tests, and seemed to be just as engaged as the children of other ethnic groups, the true correlation between engagement, and test scores would be suppressed if the scores were used. Therefore the Hispanic children were excluded from the analysis of the relationship between teacher behaviors and student engagement.

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RESULTS

Reliability & Descriptive Information

As shown in Table 1, inter-rater reliability of teacher behaviors (measured as intraclass correlations) ranged from adequate (.69), to excellent (.93). Table 2 presents the means of teacher behaviors, student engagement, and student scores on tests of emergent literacy. The preschoolers were on average 1.25 standard deviations (SD) below national age level norms on the PPVT, 1.77 SD's below national age level norms on the One-Word and .97 SD's below national age level norms on the ITPA, suggesting that these children are at high risk for future academic failure. On average, the proportion of student on-task was 68%. The measures of teacher behaviors show that on average, teachers asked less than 1 question every 30 seconds and positively reinforced a student about 1 time every minute.

Relationship Between Teacher Behaviors and Student Engagement

As shown in Table 3, correlational analysis were performed on the relationship between all 5 teacher behaviors and student academic engagement (measured by on-task behavior). Because teacher characteristics and behaviors were expected to influence an entire group of children, the appropriate unit of analysis was the teacher. All correlations were in the expected direction. There is only a .03 chance that all 5 correlations would be in the predicted directions I expected them to be purely by chance. Teacher enthusiasm, voice volume/inflection, positive feedback, and use of inquiries all had positive correlations with student academic engagement, indicating that the more a teacher exhibited these behaviors on average, the more on-task their students were. With respect to difficulty of lesson, a low score represented a teacher teaching at or near the optimal level. Therefore the negative correlation suggests that the farther away the level was from optimal (and the higher the score) the lower the level of student engagement.

Correlational analyses revealed that teacher enthusiasm, and teacher voice volume/inflection were highly correlated (.797,$p<.001$) This high correlation between 2 teacher variables could lead to multicolinearity in the multiple regression equations. To avoid this problem a new composite variable was created. Enthusiasm and voice volume/inflection were standardized and averaged, and this new variable was used in the following multiple regression analyses.

The modest correlations between the teacher behaviors and student engagement suggest that other factors must be influencing engagement as well. Based on clinical experience, and previous studies (e.g. Arnold, McWilliams & Arnold, 1996) which suggest that teacher discipline has a prominent role in many classroom activities, it was decided to include a measure of teacher discipline in the present study. There is evidence that parents and teachers who are lax in their enforcement of discipline have children (Arnold, O'Leary, Wolff, & Acker, 1993) and students (Arnold, et al., 1996) who misbehave significantly more often. Teacher and parent firmness in enforcing discipline seems to have the opposite effect. It seemed possible that teacher firmness/laxness could be related to student academic engagement as well. A teacher who is firm with his or her students regarding discipline may have a less disruptive classroom in general, allowing increased student academic engagement to occur. Measures of teacher firmness/laxness were obtained through observation of videotapes by coders as part of another study. These were different coders from those who coded student engagement and the 5 teacher behaviors of initial interest, and they were unaware of the present study.

A simultaneous multiple regression was performed. Use of inquiries was dropped due to its low correlation with student on task behavior. The resulting equation contained 4 independent variables (lesson difficulty, positive feedback, the composite of enthusiasm, and voice

volume/inflection, and teacher firmness). The dependent variable was proportion of on-task behavior.

As shown in Table 4, an increase of 1 instance of teacher use of positive feedback to the class every 30 seconds was associated with an increase of 45% in the proportion of student on-task. An increase of 1 on the scale of 1-7 in the composite of teacher enthusiasm and voice volume/inflection was associated with an increase of 21% in the proportion of student on-task. An increase of 1 on a scale of 1-7 in teacher firmness was associated with an increase of 39% in the proportion of student on-task. Finally, an improvement of 1 on a scale of 1-7 in difficulty of lesson was associated with an increase of 10% in the proportion of student on-task. The percentage of variance accounted for in student on-task increased from 35% to 43% after including the measure of teacher firmness/laxness.

Relationship Between Student Engagement and Emergent Academic Skills

The relationship between student academic engagement and performance on tests of emergent academic skills was examined. Student academic engagement was measured using the on/off task behavior of students. Emergent literacy was measured by testing the preschoolers with the Expressive One-Word Picture Vocabulary Test, the Peabody Picture Vocabulary Test-Revised, and the verbal expression subscale from the Illinois Test of Psycholinguistic Ability. All scores obtained on these tests were standard scores, which control for the age of the test taker. Simple correlations are presented in Table 5.

A statistically significant relationship between student academic engagement and emergent verbal ability was found. This relationship was found for the One-Word Picture Vocabulary Test, and the Peabody Picture Vocabulary Test-Revised. The relationship between engagement and score on the Illinois Test of Psycholinguistic Ability was not statistically

significant, though it was in the expected direction.

Table 1
Reliabilities of coded data

Teacher Behaviors	Inter-rater Reliability
Average Enthusiasm per Video Segment	.81
Average Lesson Difficulty per Video Segment	.79
Average Voice Volume/inflection per Video Segment	.69
Average # of Positive Feedback per Video Segment	.93
Average # of Inquiries per Video Segment	.93
Student Academic Engagement	
On-Task Intervals/ (On-Task Intervals+Off-Task Intervals) per Student per Video Segment	.89

Table 2
Means of teacher behaviors, student engagement, and student scores on measures of emergent literacy skills

Test	Mean	SD
One Word	81.22	16.57
PPVT	73.41	15.81
ITPA	31.38	4.76
ON/(ON +OFF)	.68	.24
Teacher Firmness/Laxness	2.97	1.72
Enthusiasm	4.58	.78
Lesson Difficulty	.89	.77
Voice Volume/inflection	4.84	1.15
# of Positive Feedback/interval	.41	.42
# of Questions/interval	.94	.81

Note. The national means of the One Word, and the PPVT are 100, with an SD of 15. The national mean of the ITPA is 36, with an SD of 6

Table 3
Correlations between teacher behaviors and student academic engagement (N=13)

Teacher behaviors	Student Engagement	p value
Enthusiasm	.30	.32
Lesson Difficulty	-.29	.33
Voice Volume/inflection	.46	.12
Positive Feedback	.51	.07
Inquiries	.12	.70

Note. *p<.05.

Table 4
Summary of multiple regression analysis for variables predicting student on-task behavior (N = 13)

Variable	B	SE B	β	p-value
Teacher use of positive feedback	.454	.29	.177	.16
Composite of teacher enthusiasm and teacher voice volume/inflection	.210	.28	.035	.47
Teacher firmness/laxness	-.390	.37	-.038	.32
Difficulty of lesson	.103	.39	.022	.80

Note. R2 = .43 *p < .05.

Table 5
Correlations between student academic engagement and student scores on tests of emergent academic skills (n=67)

	One Word	PPVT	ITPA
Student Engagement	r=.267, p=.028*	r=.2979, p=.014*	r=.132, p=.285

Note. *p<.05.

DISCUSSION

The purpose of this study was to 1) examine the relationship between teacher behaviors and student academic engagement, and 2) to examine the relationship between student academic engagement and student academic achievement. Previous studies had not examined the link

between teacher behaviors and student engagement using objective measures and in an inner-city preschool, nor had they examined both links with the same group of students.

Correlation and regression analysis were conducted to evaluate the hypothesis that there would be a relationship between 5 teacher behaviors and student academic engagement. While the observed correlations between the teacher behaviors and student academic engagement were in the expected direction, these correlations were moderate, and none of them were statistically significant.

The primary reason for the lack of statistically significant relationships was likely insufficient power. The conservative unit of analysis that was used (teachers) made it difficult to detect small to moderate relationships between teacher behaviors and student engagement. Much research on teacher effects encounters this power problem. While it is not particularly difficult to obtain an adequate sample size of students, it is quite difficult and costly to find an adequate sample size of teachers.

Besides the lack of statistical significance, the magnitude of the relationships between teacher behaviors and student academic engagement was somewhat smaller than expected. The most obvious reason is that perhaps the teacher behaviors that were studied are not the behaviors that are most important in stimulating student engagement. Thus in addition to collecting a larger sample of teachers, future studies should attempt to examine other teacher behaviors.

It may also be the case that these teachers in particular were not able to affect student engagement as much as was hypothesized. It may be that the preschool environment itself sapped some of the influence that these teachers may have had on their student's engagement. Based on my experience at a number of different preschools, I found the preschool in this study to be unconducive to learning for a number of reasons. The student-teacher ratio was poor, the lack of

materials was apparent, and there was clearly a lack of space for the number of children. It is not surprising, given the multiple stressors faced by teachers, students, and parents, that the preschool environment was not optimal. Empirical evidence suggests that children in poor classroom environments may be concerned with things other than learning. Burts, et al. (1992) found that children in developmentally inappropriate classrooms exhibited significantly greater stressful behaviors. Further, Bryant, et al. (1994) found that the quality of the environment in Head Start classrooms was significantly related to achievement in preacademic skills. It seems likely that the quality of the classroom environment could affect academic engagement as well. In sum, I may have expected the dynamics of this preschool to be like ones of upper-income preschools, and this may not be the case for many preschools that serve poor, inner-city children. Nevertheless, results suggest that a substantial amount (43%) of the variance in student academic engagement can be attributed to the teacher behaviors that were investigated. Future researchers may wish to investigate whether there is a stronger relationship between teacher behaviors and student engagement for higher SES samples. It may be that with better classroom management, teacher variables become even more important to engagement.

Another explanation for the somewhat smaller than expected correlations between teacher behaviors and engagement is that the home environments of these children may have suppressed these correlations. It seems likely that many of these children came from homes where they were not cognitively stimulated to a sufficient degree. It is possible that even an extremely engaging teacher cannot make up for a poor home environment with little one-on-one language interaction. Whitehurst, et al., (1994a) noted that students from low SES families need frequent one-on-one language interactions with an adult to strengthen their language skills. Group based interactions may not be sufficient in the late preschool years, even if the groups are small and the forms of

interactions are optimized. One-on-one contact may also be needed for enhanced academic engagement. By the time the children enter school they may not be conditioned to pay attention to an adult during a teaching interaction. They may only pay attention when an adult is speaking only to them, as happens at home, and not when an adult is speaking to them as well as thirty other kids, as is the case in school. Numerous other studies suggest the link between the quality of a child's home and his or her language skills (Bryant, et al., 1994; Whitehurst et al., 1994b; Lonigan, 1993). A counter-argument to the above hypotheses is that children were on-task an average of 68% of the time, a figure that seems high, and certainly doesn't seem surpressed. I would argue that the figure of 68% is in part due to a "floor effect". That is, the dynamics of the classroom make it likely that even the most disaffected classroom of students would be found to have a moderate percentage on-task. Therefore the figure that was obtained from the present sample (68%) may be below average in comparison to other preschools.

The second link of the proposed relationship, the link between student engagement and academic achievement, was clearly supported. On average, students who were more engaged scored significantly higher on tests of emergent literacy, even when age was controlled. Two of the three measures of academic achievement were significantly related to engagement. The relationship between engagement and the third measure of emergent literacy, the ITPA was not statistically significant. I am unsure why the relationship between engagement and ITPA scores was not stronger. Overall, these results are consistent with past research suggesting a link between student academic engagement and academic achievement.

A number of limitations should be considered when interpreting these data. First, and most important, the design of this study was not experimental, limiting any conclusions about causality. While I have suggested a two step causal model, it is possible that the true causal

structure of these steps is quite different. Future studies should attempt to sort out the causal connections between teacher behaviors, student engagement, and student achievement, preferably with experimental designs.

Second, teacher and student behavior may have been affected by the presence of the camera and the researchers. Teachers could have changed their teaching style, and possibly increased the behaviors that were coded because they knew they were being taped. This effect may have been small as evidenced by the fact that a number of teachers reported that they "forgot the cameras were there" after just a few tapings. The children as well seemed to habituate to the presence of the cameras. During the first few sessions students would occasionally come up to the camera or talk to the researchers. However, after an initial period of curiosity the children seemed to ignore the presence of the camera and of the researchers. Furthermore, it was strongly emphasized to the teachers that all videotape information gathered was strictly confidential and would not be used for the purposes of evaluation.

Another threat to the validity of this study was that the same coders coded both teacher behaviors and student academic engagement. This coding procedure could have biased the results if coders took into account the behaviors of teachers when coding students and vice-versa. It is likely that some coding spillover did occur. However, I believe that any spillover was minimized for a number of reasons. First, all coders were blind to the hypotheses of the researchers, so they were presumably not looking for anything in particular from teachers when they were coding students, and from students when they were coding teachers. Second, no coder ever coded the teacher and students during the same clip. Furthermore, the coders who coded the teacher discipline ratings did not code anything else, making the teacher discipline ratings completely independent of any other coded behaviors. Third, the ratings of student academic engagement

were based on specific operational definitions of whether students were on-task. There was little room for variation from these definition.

A solution to the problem of coder spillover would be to have 2 segments of each teacher teaching the same activity to the same class of students. Teacher ratings could be obtained from one clip, and student ratings from another. While this could eliminate spillover effects it might not accurately answer the questions being investigated if teachers were not consistent in their teaching behaviors. This method was simply not possible in this study because I did not have 2 clips of each teacher teaching to the same students. I did use this method to obtain my teacher discipline ratings. It was hypothesized that teacher discipline would be very stable over time. Therefore teacher discipline ratings obtained from a different video clip would adequately represent teacher discipline during the primary video clip. In sum, as with all exploratory studies, results need to be replicated in other settings, and with other samples.

While this study was an exploratory one, it has a number of practical implications for the management of schools and for research. It may be that teachers can be trained to elicit engagement because they can adjust their style or the activities that they are leading by observing the engagement of their students. In fact there is strong evidence that teachers and students do observe and affect each other in a reciprocal manner in the classroom (Skinner & Belmont, 1993). I think that "engagement training" could increase student engagement in at least two ways. By teaching in a manner that is more engaging, students may benefit immediately by being drawn to the activity being taught. Furthermore, it may be that engagement elicited by teacher behaviors leads to a long-term change in students' engagement. Students may come to develop intrinsic academic interest and intrinsic engagement over time, and be less reliant on the teacher for the motivation to pay attention. In other words, if teachers can "hook" children onto learning, the

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children can take it from there. Intrinsic engagement may be particularly important for better school outcomes. Marshall (1987) has argued that choosing to engage in tasks for one's self may lead to increased academic engagement and performance. It was my hope that building a model of the causes of student academic engagement using these teacher behaviors would help the understanding of the complicated causal processes that occur in the classroom, and facilitate the development of a teacher engagement training intervention.

From a research perspective, I would argue that future studies and interventions aimed at increasing student academic achievement should include outcome measures of student academic engagement. It is a worthwhile variable given evidence that engagement is related to school achievement and because one of the goals of school should be for students to enjoy the learning experience. Furthermore, student academic engagement has been shown to be an important predictor of emergent literacy. Future studies should investigate whether engagement is a significant predictor of other emergent skills such as mathematics. Aside from studying engagement as a mediating variable between teacher behaviors and student achievement, engagement has inherent worth. Academic performance is not the only criterion in evaluating the usefulness of a teacher behavior. The evaluation of teacher behaviors should also include measurements of subjective experience. In other words, the goal of researchers and educators should not solely be to get kids to learn, but also to help kids enjoy learning. As far as the methodology of future studies is concerned, the focus on objective measures of student engagement should be maintained. It is possible that adding subjective measures, such as asking students which teachers they find engaging, could be used as additional measures.

The finding that student academic engagement predicts literacy skill does not bode well for the children who are not often engaged in school. I believe that the Matthew effect,

(Nicholson, & Whyte, 1992) the tendency for students who read poorly to read less than their optimally performing counterparts, may well hold true for academic engagement. Children who are usually engaged in learning may be reinforced to be engaged in the future, while students who are not engaged may be similarly reinforced to be disaffected from future lessons. Thus the proverbial viscous circles are formed. There is empirical evidence that the Matthew effect may be occurring in regards to academic engagement. Skinner and Belmont (1993) found reciprocal effects that are magnificatory, in which student academic engagement elicits positive teacher behaviors. This study only reiterates the call already being made by many educators and researchers to work from a preventative standpoint with inner-city minority children.

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